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☞See advertisement on last page.

Poetry.

CONSOLATIONS FOR THE LONELY.

BY MARY HOWITT.

There is a land where beauty cannot fade,
Nor sorrow dim the eye;
Where true love shall not droop, nor be dismayed.
And none shall ever die!
Where is that land, O where!
For I should hasten there;
Tell me—I fain would go,
For I am weary with a heavy wo!
The beautiful have left me all alone;
The true, the tender, from my path have gone;
O guide me with thy hand,
If thou dost know that land,
For when burthened with oppressive care,
And I am weak and fearful with despair;
Where is it? Tell me where.

Friend thou must trust in him who trod before
The desolate paths of life;
Must bear in meekness as he meekly bore,
Sorrow and pain, and strife;
Think how the Son of God
These thorny paths hath trod;
Think how he longed to go,
Yet tarried out for thee the appointed wo.
Think of his weariness in places dim,
Where no man comforted or cared for him!
Think of the blood-like sweat,
With which his brow was wet;
Yet how he prayed unaided and alone,
In that great agony, "Thy will be done!"
Friend do not thou despair;
Christ, from the heaven of heavens will hear thy prayer!

THE FATHERLESS.

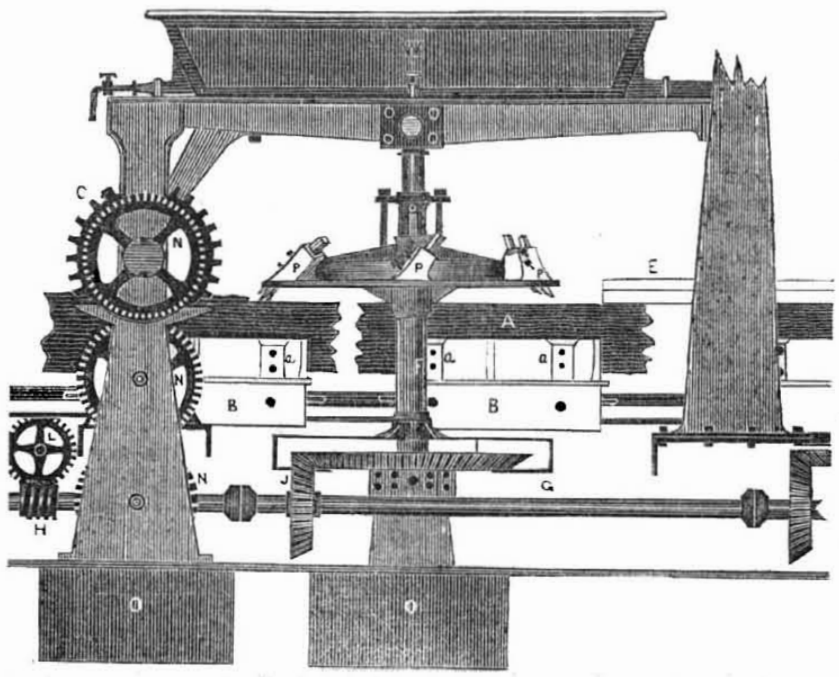
"Speak softly to the fatherless!
And check the harsh reply
That sends the crimson to the cheek,
The tear-drop to the eye.
They have the weight of loneliness
In this rude world to bear;
Then gently raise the fallen bud,
The drooping flowerets spare.

Speak kindly to the fatherless!
The lowliest of their band
God keepeth, as the waters,
In the hollow of his hand.
'Tis sad to see life's evening sun
Go down in sorrow's shroud,
But sadder still when morning's dawn
Is darkened by the cloud.

Look mildly on the fatherless!
Ye may have power to wile
Their hearts from sadden'd memory
By the magic of a smile.
Deal gently with these little ones
Be pitiful, and He,
The friend and father of us all,
Shall gently deal with thee!"

Mr. and Mrs. Randall, the celebrated Scotch giant and giantess, have recently had a son born to them, at their residence, near Mineral Point, Wisconsin, whose weight at three days old was twenty two pounds! This is their first child, and is, we believe, the first successful experiment in modern times, in the production of a race of giants. They do great things in Wisconsin now a days.

STONE CUTTING MACHINE.---Figure 1.

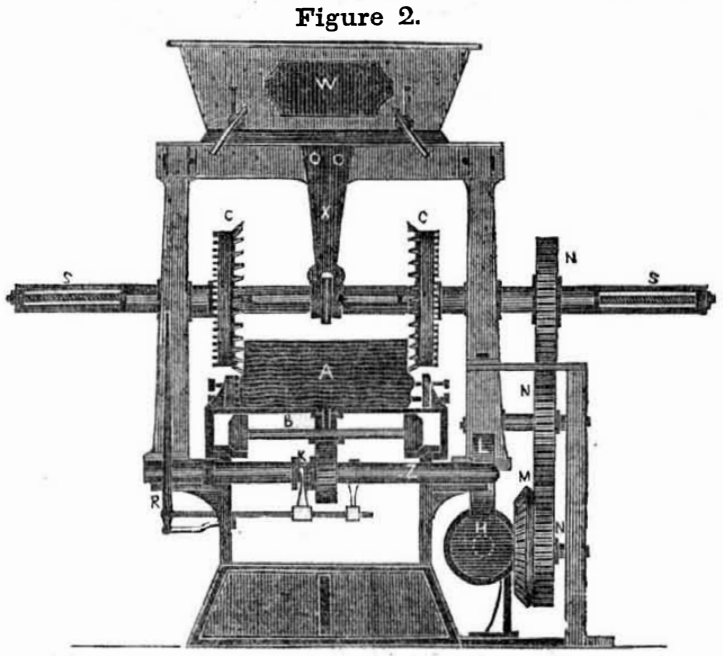


This is a Stone Cutting Machine which we publish for the benefit of our subscribers and those who are engaged in the stone cutting business. It is a machine perfectly practicable and will work well. It is public property and a good mechanic skilled in the art may construct one similar to it from these drawings. Wealthy companies who have large quarries would, we think, find it profitable to have such a machine, as it would no doubt be a great saving for plain work. For ornamental work it is not intended. In that branch the head and the hand of the skilful workman have as yet found no equal and never will

DESCRIPTION.—Fig. 1 is a side elevation and fig. 2 is an end view. The same letters refer to like parts on both.

The stones are carried forward in carriages, below revolving cutters, one set to cut the sides of the stone and another set to cut the surface. The carriage may be made in two pieces, the upper part, like a turn table to swing round if desired. The underside of each carriage has a rack on it and is moved forward by spur wheels gearing into said rack. Their may be a continuous round of this gearing, so that the carriage may move continually round. A is the stone in the carriage, made firm by strong set screws *a a*, as seen in fig. 2. B is the carriage—a train of which is shown passing through the machine. C are the two side cutting wheels. These wheels are adjustable; the shafts are turned parallel and coupled at the middle suspended in the bearing X fig. 2 The shafts are hollow about half their lengths, and have two broad strong

Figure 2.



feathers each—one on each side. On the outer end is a nut fastened, which works a screw S, which is made to shift the naves of the cutter wheels to any width required. The wheels move to cut at the front only; so that the tools when they come to the lowest point in the machine, move off leaving it untouched behind. The side cutter wheels are moved by cog wheels N N N, working a worm wheel H, on G the main driving shaft, that meshes into the bevel wheel M, on the shaft of the lower N. F is the shaft on which the cutters that cut the face of the stone are arranged and attached. The cutters are fixed in sockets P, near the periphery of the wheel, of which there are two, one on each side, both alike, and the cutters set so that those of one wheel pass alongside at the middle of the stone just after the other. The shaft F is made to be set at an angle from the perpendicular line, so that the cutters will not touch the stone behind as seen in fig. 1. This shaft is revolved by J a bevel wheel on the main driver meshing into I, a large bevel wheel on the bottom of F. We have thus described the top and side cutting operation. There may be as many tools used as desired fixed with set screws in the sockets P, and of different forms to suit the kinds of stone to be pressed. The wheels and shafts must be boxed in to keep them from dust. W is a large water cistern above to be used if necessary. E at the section post behind, may be a polisher driven by the same power to polish the stone in its progress, and finish them at one operation. O O, is the bed framing. It remains now to be explained how the carriages are moved. This is accomplished as follows: H the worm wheel on the shaft G, meshes into L and drives the cross shaft Z, as seen in fig. 2 at the middle of which is a spur pinion that works the rack in the bottom of each carriage moving them forward. R, fig. 2, is a lever which operates the clutch K, to stop the carriage at pleasure. Cutter wheels may also be arranged to cut the ends of the stones, and the serrated and pointed or flat chisels may be very effectually used. For the cutting of heavy blocks, such a machine would be a great acquisition for rapid and cheap stone dressing. We know of no machine equal to one of this description in all respects, and the public are now both the judges of its merits and possessors of its principle.

RAIL ROAD NEWS.

Housatonic, New York and New Haven Railroads.

An indignation meeting of the passengers who left Albany on Tuesday of last week was held the next day at the Harlem Railroad House in this city, expressing their disapprobation at the treatment they received from the several companies. The cars were 24 hours on the route and they were delayed in one of the most bitter cold nights upon the road, and at Harlem were left without fuel, fire or lights. One man almost perished from the effects of the cold and a number of females suffered severely.

New York and New Haven Railroad.

The first regular train from New York over this railroad, left this city on Friday the 29th ult. and arrived at New Haven in a running time of less than 4 hours, although the track was obstructed by snow. The distance from New Haven is 76 miles. The fare is established at the low rate of $1,50, or two cents a mile. Two trains are advertised, leaving New Haven at 6 o'clock A. M. and 1 P. M., and leaving New York at 8½ A. M. and at 3½ P. M.

Nashville and Chattanooga Railroad.

We have received from W. H. Humphries, Esq. the first annual report of the stockholders of this road. The report of the chief engineer is an able one. The whole route has been surveyed, the points determined and many contracts made. It is to be hoped that Tennessee, so long and far behind our Eastern States in Railroad enterprise, will now exhibit an energy and enterprise which will make up for lost time and character.

Most of the railroads in Great Britain have lowered the price of travelling to 1½ cents per mile and the consequent increase of travel has not only made up for the decrease, but the average income has been greater.

Telegraphs.

The British Government are going to lay telegraph wires across the Irish Channel, from Wales. This is certainly a great undertaking for the wires have to be laid in pipes in the bed of the sea, a distance of 60 miles.

The copying telegraph of Mr. Bain sends 400 letters per minute with a single wire from London to Slough.

Settlement of the Niagara Bridge Question.

It is reported that the company and Mr. Ellett have settled their difficulty. He is to receive $12,000 and his shares taken at par—Mr. Buchanan has been engaged to complete the work. No less than $8000 have already been taken from passengers crossing.

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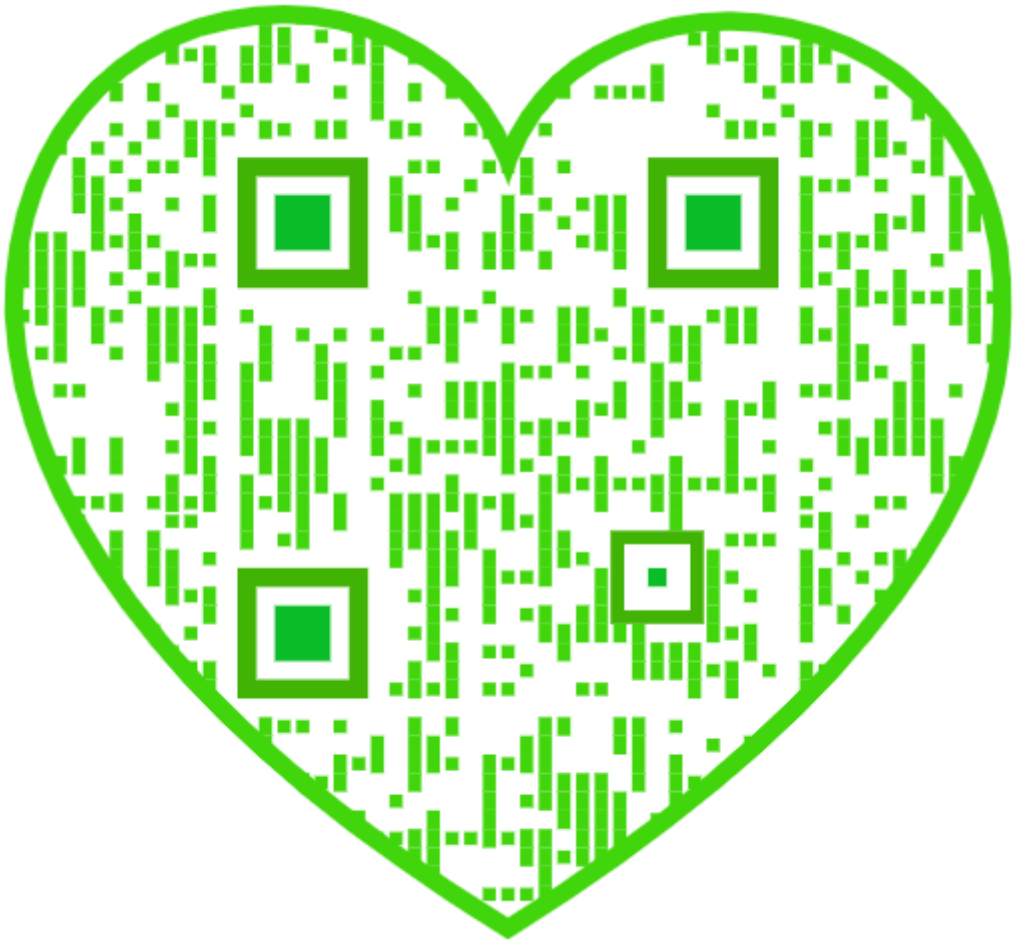

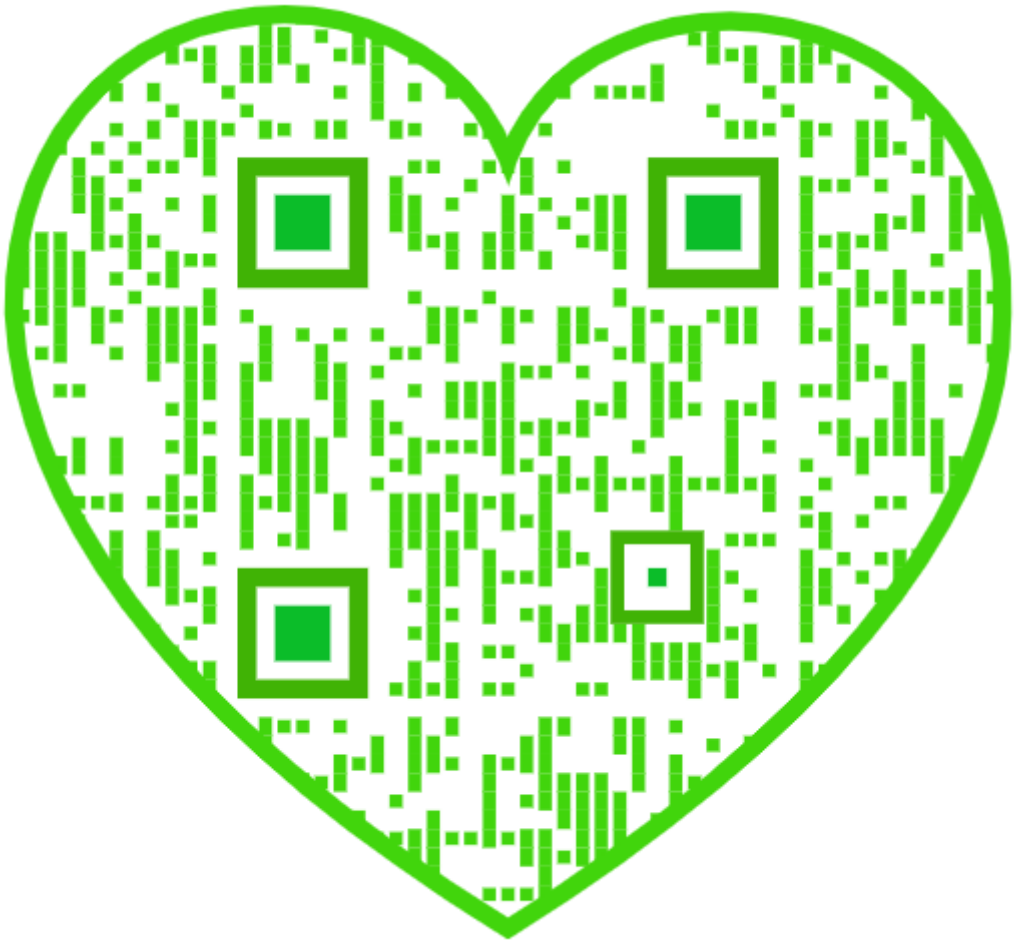

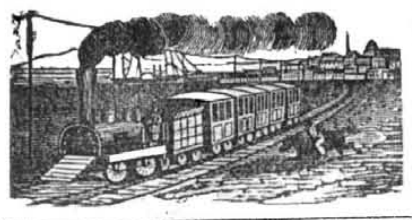

Boiler Explosions.

Hon. Edmund Burke, the Commissioner of Patents, has sent in an able Report to Congress on "Steamboat Explosions and their remedies." The scientific part of the report is profound and correct. The Commissioner considers that the law of Congress in relation to the appointment of 'Steamboat Inspectors,' to be radically defective. He considers their appointment by the District Judges to be wrong, and recommends a rigid examination of candidates to test their ability before permitting them to fill such situations. This is what we call even down honesty in a report. The District Judges are not fit persons to judge of the capability of a person to inspect the qualities of the hull and machinery of a steamboat. He also recommends that proprietors be made responsible for all damages of life and property. This is a bold recommend, but certainly there is some measure of the kind demanded, and we are glad to see him recommend it so fearlessly.

Postal Arrangement with Great Britain.

Sea Postage 16 cents, paid to the vessel performing the service; English inland postage on letters to or from the United States, 1½d. or 3 cents: inland postage of the United States on letters to or from England, 5 cents; so that a letter from any part of England to any part of the United States, or vice versa, will cost 24 cents—pre-payment or not, at the option of the sender; but, if pre-payment is made, it must be for the whole. Newspapers will be sent in the steamers of either country at a charge not exceeding 2 cents to be prepaid. Pamphlets, periodicals, &c. will be charged for each, not exceeding 2 ounces, 1 penny or 2 cents; over 2 and not exceeding 3 ounces, 6d or 12 cents; over 3 and not exceeding 4 ounces 8d or 16 cents; for all exceeding 4 ounces, 2d or 4 cents each additional ounce or fraction. Closed mails may be sent through the United States to North American provinces accompanied by an agent, at 10 cents the ounce; and 25 per cent. additional for counting by the ounce instead of the single letter. Closed mails of the United States may be sent through the Canadas, or the United Kingdom, upon paying, by the ounce, two rates of the inland postage, and 25 per cent as above.

This is better than it was before but, it must come down a peg lower yet—5 cents is enough for an ocean postage.

Planing Machine and Portable Saw Mill.

Having disposed of the contents of a large Machine shop except one of Daniel's superior Planing Machines and one portable saw mill, we are induced to offer the balance at a great sacrifice to close the concern and save expence of storage. The planing machine was represented in No. 7 of the Scientific American and is an excellent good one, replete with cutters and in order for use. The saw mill is described in our advertising columns as is also the planing machine, and its dimensions are there stated. The saw mill we will sell for $40 cash and ship it to any address at the risk of the purchaser and the Planing Machine we are induced to offer (for reasons above stated,) for $200 which is but little more than half its worth. Address Munn & Co. Scientific American Office.

Dick's Anti-friction Press.

The manufacture of Dick's Anti-friction Press, (an advertisement of which will be found in another column) has commenced in the Tribune Buildings, this city. This is a kind of Press constructed upon a principle which combines the simplest and most effective lever power, and is capable of being applied to any kind of press whatever, giving the greatest amount of power in the smallest space and in the most economical manner. It is a beautiful invention.

LITERARY NOTICES.

We are not disposed to recommend to our readers every publication that is issued in the form of Monthly Magazines. In many instances they are wholly unworthy the objects for which they are intended. The want of proper discrimination in the selection of reading matter too often constitutes ground for objection to monthly as well as weekly publications. But we are confident that no person who has had the good fortune to secure the Jan. and Feb. Nos. of Sartain's Magazine, can lay them aside without feeling agreeably entertained and profitably instructed. Among impressive features of the Feb. No. are two fine engravings: The First Appeal, and John the Baptist preaching. We shall rejoice to hear of its wide spread circulation and of Mr. Sartain's deserved success. Dewitt & Davenport are agents for New York city.

The 1st No. of vol. 14 of the Boston Olive Branch has made its appearance in a new Typographical Dress, considerably enlarged and beautified. This truly popular weekly has secured a position among the intelligent of the community, that may well excite the envy of the oldest publication of the day, the secret of the deserved success that has attended the Olive Branch, through its long pilgrimage, can be attributed to the high moral sentiment that has uniformly found place in its columns. The editorial department has ever been conducted with ability, and you can scarcely find an article throughout its whole existence that does not furnish food for an inteligent mind. As a family paper it cannot be surpassed, and we cheerfully recommend it to the attention of our readers, and hope to hear of its still further success. Thos. F. Norris & Co. publishers, Boston, Mass.

Aristocracy in London.

The London Times says that "every young man in the metropolis, if he will only attend to his business, whatever it is, and keep out of scrapes, is a rising man, and has all the honors and prizes of the nation before him, if not for himself or his children, at least for his children's children There is no reason to complain when this is the case. We have no exclusion of race. Take any dozen men in good circumstances, either at the east or the west end of London; take them in a club in Pall Mall, or in the Exchange, and inquire into their origin. One is an Irishman, another a Scotchman, another a Welshman. Perhaps half of them can show a Celt in his pedigree. The same number can produce an ancestor driven to this country by the edict of Nantes, or a foreigner of still more recent date. So much for race. As for condition, the great-grandfather of one was a laborer; of another a gentleman's butler, of another a weaver, of another a journeyman blacksmith, of another a hair dresser, and so forth. So far from the trade and commerce of London being at all a monopoly, it is notorious that nearly all the tradesmen of London or their immediate ancestors came from the country."

The same may be said about every city. It shows us, that if the right of primogeniture was abolished in Britain, her nobility would be unknown in two centuries.

Another Cure for the Cholera.

The following is Gen. John Barker's cure for Cholera, which he employed successfully in Egypt, while Consul General for England.

As soon as the vomiting and diarrhœa begin, put the patient's legs up to the knees in water, as hot as the hand can bear; throw into it six or seven handfuls of coarse salt; let the legs be rubbed for half an hour by two strong persons, using both their hands. Open the large vein of each foot and let it bleed in the hot water from twelve to twenty minutes according to the sex, age, and strength of the patient. During this time, add more hot water as it becomes cooled; the natural animal heat will return immediately throughout the whole body as well as consciousness. The patient will soon speak and ask for food. He will be perfectly able to resume his ordinary duties after one or two days.

There is something sensible in this plan after all.

Experiments in Gunnery.

The London Sun says that a series of experiments have been carried on for some time past at the Royal Arsenal Woolwich, to ascertain the practicability of employing two shots at one firing in actual service and how far danger was to be apprehended to those employed in working the guns when double shotted.—Captain Chads made several experiments on his principle on board the Excellent, gunnery ship, at Portsmouth, which were most efficient and satisfactory to him, and on submitting the plan to the authorities, the matter was referred to the members of the select committee at Woolwich, who gave instructions that an 8-inch gun of 65 cwt., 9 feet long, should be selected from a quantity recently received from the Low Moor Company, in Yorkshire. The guns selected had been previously tested in the usual way, by firing two rounds with one solid shot and twenty pounds of powder each time; and the experiments were commenced by firing two 50 pounder hollow shot with five pounds of powder each charge, and continued with the double shot and the same quantity of powder up the 60th round. From the 61st to the 220th round experiments were tried with various charges of from six up to twenty-one pounds of powder ten or more repetitions with each charge. The last ten rounds with the heavy charge of twenty-one pounds of powder, and the gun double shotted each time, were fired next day, and on examining the gun after the experiment, it did not appear to have any perceptible injury, notwithstanding the severe test it had undergone. It is intended to carry on the experiment until the gun is burst, and to add an additional pound weight of powder to each charge after every ten rounds. The firing has already disabled one carriage, and a carpenter attends the experiments in case of injury to the platform by the recoil. The ultimate results is now looked forward to with great anxiety, the test the gun has already experienced having so far exceeded the anticipations of the officers who have witnessed the experiments.

Changes of Vegetation and Climate.

M. Adolphe Brongniart considered everything to prove, on the one hand, that the different vegetable creations which have succeeded each other on the globe, have become more and more perfect; on the other hand that the climate of the surface of the earth is greatly modified since the earliest times of the creation of living beings up to the commencement of the present epoch.

A Cave.

The following account is given of a cave in a lime stone chain of hills not from San Sebastian:—"In the year 1838, a Mexican, Don Juan Flores, perceived the hidden entrance to a cave. He entered, but seeing inside a council of Indian warriors sitting together in the deepest silence he retreated and told it to his companions, who, well prepared entered the cave together, and discovered about 1000 well preserved Indian corpses squatted together on the ground, with their hands folded below their knees; they were dressed in fine blanket made of the fibres of lechuilla, with sandals made of a species of liano on their feet, and ornamented with colored scarfs, with beads or seeds of fruit, polished bones, &c. This is the very insufficient account of a very mysterious burying place. The Mexicans suppose that it belonged to the Libans, an old Indian tribe which from time immemorial has roved and is roving over the Bolson de Mopinie."

The British Museum.

A splendid specimen of mosaic pavement has been placed in the national collection at the British Museum, in the passage leading to the gallery of Xanthian Antiquities. The specimen is about eight feet square—was found in the ruins of Carthage, on a spot assigned as the site of the Temple of Neptune—and was purchased by the Trustees of the Museum.—On reaching the country it was found broken in innumerable pieces; but under the hand of Sir. R. Westmacott it has been restored. It presents the head of a sea god, with a flowing beard, and feet of the seashore.

There is a happy and flourishing Scotch settlement of one hundred families in Walton county, Florida, 80 miles from Pensacola.

The Value of Practical Science.

The cultivators of the olive in the south of France—in two years out of three, lost oil to the amount of nearly 6,000,000 of francs annually by the attacks on their olives of the grub of a little fly (*Dacus oleæ*)—were utterly unable, with all their "practical" skill, to help themselves in any shape. M. Guerinmone-ville, though no cultivator, applying his entomological knowledge of the genus and species of the insect and of its peculiar economy, to the case, advised that the olives should be gathered and crushed much earlier than usual, and before the grubs had had time to eat the greater part of the pulp of the fruit; and by their adoption of this simple plan, the proprietors of olives in the years they are attacked by the *dacus*, can now obtain an increased annual produce of oil, which was formerty lost, in consequence of their allowing the grubs to go on eating the olives till they dropped from the tree.

Racoon in England.

A genuine American racoon was recently discovered in a field near Tamworth, the residence of Sir Robert Peel. He was immediately attacked by several dogs, but defended himself bravely, throwing himself on his haunches and biting and scratching his assailants so furiously that they were compelled to retreat. He then ran up a tree, and a countryman climbed up after him; but the coon set John Bull at defiance and drove him to the ground with many grievous scratches. The courageous animal was at last brought down by two shots from a fowling piece. He is supposed to have escaped from a menagerie.

Curious Fact.

The Rochester Democrat says that a Mr. Samuel Davidson, of Greece, N. Y. caught 50 small worms, scraping them from the snow which fell on the 5th of Dec. They were about half an inch long and very thin, but came down with the snow in innumerable quantities, almost covering the whole surface and when they were put into warm water they became quite lively.

The Steam Ship Panama.

A short time ago this splendid steam ship smashed her piston and cylinder at sea and had to return to this port. The cause of the accident it seems was a pine block, which, either by accident or neglect, had made its way into the cylinder. The whole damage had evidently been done by a single blow.

Cause of Grey Hair.

The disturbances of the heart produced by sudden misfortunes affect the cutaneous capillaries in such a way as to cause the hair to turn white in a few hours. A recent English medical work contains numerous examples of this fact.

On Christmas morning last, Mr Charles Ellett, jr. the contractor of the Suspension Bridge at Niagara Falls, together with Mr. George Hamlin, drove across the bridge in a canter, and returned on a trot. It would truly appear to be a perilous feat, thus to drive across that apparently frail structure of iron wire suspended 230 feet above the boiling stream, at a rapid rate.

According to the Philadelphia Times, the gold fever is first indicated by an unusual opening of the ears, a singular expansion of the eyes, a yellow cast of countenance, a clutching of the hands, and a thrusting them repeatedly into the trowser's pocket.

Fowls, to which a portion of chalk is given with food, lay eggs having shells remarkable for their whiteness. By substituting for chalk, a calcareous earth, rich in oxide of iron, the color of the egg shell will be of an orange red.

Of the 6100 sailors who man the American navy, 960 are native Americans; the rest are chiefly composed of Irish and English emigrants.

The American, a stern wheel boat, bound from Cincinnati for the Wabash River, burst her fore and aft cross pipes about three weeks ago and scalded severely eight of the crew.

A ship of 500 tons burden is now in course of construction at St. Louis, and when finished she will be sent direct to San Francisco.—Another novelty in navigation.

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For the Scientific American.

Drawing False Horizons.

BY CHARLES BURTON, PROFESSER OF PERSPECTIVE.

Having made the study of Perspective Drawing the chief business of my life for more than forty years; I, at a very early period, discovered that no confidence could be placed in any of the Treatises on that subject, as a reference to real objects almost invariably contradicted most of the Diagrams given to illustrate the subject, and its principles; the simple reason of which (to me) appears to be that—all the books that I have ever yet seen on the subject evidently copy the error of a work, published in London, about 200 or 230 years ago without taking the trouble to examine whether they were consistent with facts *at all times discoverable* to an observing eye.

I have often, been greatly surprised that many eminent Artists should neglect to make their own observations in this subject; but, in truth, it is so much easier to *copy* from others, or to design in the Studio, without knocking about in the arena of Nature to come at TRUTH, that many otherwise excellent works of merit make absolute *Monsters* of the "Human form divine," by their extremely *Low Horizons*

Indeed you can have no conception how almost universally prevalent this great error is; but, I hope, before I get through this humble essay, to give you and the public the means of judging for yourselves, when a picture has a natural horizon; and, as I have long felt a desire to give publicity to some of my observations on this scientific subject, I know of no periodical better calculated for the purpose, than your valuable and interesting paper, the SCIENTIFIC AMERICAN, only I could wish that some of its machines were drawn different, and that isometrical perspective (?) was totally abolished.

I could name a number of pictures, lately exhibited in the Arts Union, with very low horizons; but I shall mention no names, lest I should be charged with ill will to any artist; my aim is against error, and false principles, not against men. My ardent wish is to see the Fine Arts pursued with scientific accuracy; and my hopes, to see them liberally patronised; and to prove that I do not wish to censure modern American artists more than those of England and the old Continental schools, a work is now before me, containing (I believe) correctly engraved copies of many paintings, by very eminent artists, which are equally defective in the place of the horizon. Here is a table of a few of them:

Adam and Eve driven out of Paradise—by Vanderwerf—Place of the horizon, just above Adam's ankle.

David, with the head of Goliath—by Mortimer—Place of he horizon, halfway up David's thigh.

The Death of Samson—by A Caracci—Place of the horizon, just above Samson's knee.

The Descent trom the Cross—by Rubens—Place of the horizon, even with the second round of the ladder.

Samson slaying the Philistines—by De Loutherbourg—Place of the horizon, a little above Samson's knee.

Many more celebrated names might be added to the above, having the same error; but I will now refer you to more modern pictures, with the same fault. You must have seen "Washington crossing the Delaware," where the horizon is represented less than one-third the height of him and his horse. Now, although Washington was a fine looking man; and a truly great man; he was not a monster in height; neither was his horse; and I could defy any man, Artist or not, to throw me such a low horizon beyond a man and horse, unless he were to stoop very low, or dig a hole and jump into it, for that express purpose; neither of which positions would be natural; or probable, on such an occasion.

There are, also, whole length Portraits of John Kemble, the tragedian, Andrew Jackson, Gen. Taylor &c., some with similar, and some even with lower horizons, which you may have seen; all of which make the person appear from three to six times the height of human beings, as I will now attempt to prove, by an easy mode of demonstration.

Was you never seated in a room where you could look through the window and see the horizon, or a distant landscape; and when you arose from your seat, the distant view seemed to rise past the horizontal frame of the window with you? Or, let us ascend the spire of Trinity Church!—the distant horizon is rising too! Why we can see the the Atlantic Ocean! True—and now tell me—what is the height of Trinity spire compared to the *distance* we can see from it? Nothing, comparatively nothing! And does not this fact convince you of the *truth* of the first lesson I always inculcate, when teaching perspective, viz. *The horizon is always the height of the beholder's eye.*

Apropos—here comes Mr. Hales, the English Giant. Nature made me short of stature, you a little taller; I see the horizon a little below your eyes, and even with the breast of Mr. Hales; but if Major Littlefinger was here he could look between Mr. Hale's legs, and see it below his knees truly; but because the dwarf sees the horizon below the knees of the giant, shall we pronounce all the artists who have erred in this respect, dwarfs like Major Littlefinger? Yet me must either suppose so, or that they dug holes, and got into them to see such horizons; or that their horizons are false, which is really the truth.

In few words—if we are neither Giants, nor Dwarfs, when on any thing like even ground, we are used to see the distant horizon somewhere between the eyes and shoulders of standing men; and all that the horizon is represented below that height, make adults appear monstrously large, and children and sitting adults still more so, as we are used to see the horizon above their heads!

Now, look at your Diplomas—haul out your Bank bills, or Notes, and note how few of their Allegorical figures will bear criticism by the above correct principles.

New York.

Mirage in the Great Salt Desert.

Bryant, in his journal of a tour in California, gives the following descrption of one of the remarkble phenomena of the famous Eastern deserts, which it seems, is also to be seen in our American Salt Dersert:

As we removed onward, a member of our party in the rear called our attention to a gigantic moving object on our left, at an apparent distance of six or eight miles. It is very difficult to determine distances accurately on these plains. Your estimate is based upon the probable dimensions of the object, and unless you know what the object is, and its probable size, you are liable to great deception. The atmosphere seems frequently to act as a magnifier; so much so, that I have often seen a raven perched upon a low shrub, or an undulation of the plain, answering to the outlines of a men on horseback.

But this object was so enormously large, considering its apparent distance, and its movement forward, parallel with ours, so distinct, that it greatly excited our wonder and curiosity. Many and various were the conjectures (serious and facetious) of the party, as to what it might be, or portend. Some thought it might be Mr. Hudspeth, who had concluded to follow us; others that it was some Cyclopean nondescript animal, lost upon the desert; others that it was the ghost of a mammoth or Megatherium wandering on "this rendezvous of death." It was the general conclusion, however, that no animal composed of flesh and blood, or even a healthy ghost could here inhabit. A partner of equal size soon joined it, and for an hour or more they moved along as before, parallel to us, when they disappeared, apparently behind the horizon.

During the subsidence of this tempest, there appeared upon the plain one of the most extraordinary phenomena, I dare to assert, ever witnessed. As I have before stated, I had dismounted from my mule, and turning it in with the cabsilada, was walking several rods in front of the party, in order to lead in a direct course to the point of our destiuation. Diagonally in front, to the right, our course being west, there appeared the figures of a number of men and horses, some fifteen or twenty. Some of these figures were mounted and others dismounted and appeared to be marching on foot. Their faces and the heads of the horses were turned towards us, and at first they appeared as if they were rushing down upon us. Their apparent distance, judging from the horizon, was from three to five miles. But their size was not correspondent for they seemed nearly as large as our own bodies and consequently were of gigantic stature. At the first view I supposed them to be a small party of Indians (probably the Utahs) marching from the opposite side of the plain. But this seemed to me scarcely probable, as no hunting or war party would be likely to take this route. I called to some of our nearest men to hasten forward, as there were men in front coming towards us. Very soon the fifteen or twenty figures were multiplied into three or four hundred, and appeared to be marching forward with the greatest action and speed. I then conjectured that they might be Captain Fremont and his party with others, from California, returning to the United States by this route, although they seemed to be too numerous even for this. I spoke to Brown who was nearest to me, and asked him if he noticed the figures of men and horses in front? He answered that he did, and that he had observed the same appearances several times previously, but they had disappeared and he believed them to be optical illusion similar to the mirage.

It was then, for the first time, so perfect was the deception, that I conjectured the probable fact that these figures were the reflection of our own images by the atmosphere, filled as it was with fine particles of crystalized matter, or by the distant horizon covered by the same substance. This induced a more minute observation of the phenomenon, in order to detect the deception, if such it were. I noticed a single figure, apparently in front in advance of all the others, and was struck with its likeness to myself. Its motions, too, I thought, were the same as mine. To test the hypothesis above suggested, I wheeled suddenly around, at the same time stretching my arms out to their full length, and turning my face sidewise to notice the movements of this figure. It went through precisely the same motions. I then marched deliberately and with long strides several paces; the figure did the same. To test it more thoroughly, I repeated the experiment, and with the same result. The fact then was clear. But it was more fully verified still, for the whole array of this numerous shadowy host in the course of an hour melted entirely away, and was no more seen The phenomenon, however explained and gave the history of the gigantic spectres which appeared and disappeared so mysteriously at an earlier hour of the day. The figures were our own shadows, produced and reproduced by the mirror-like composition impregnating the atmosphere and covering the plain. I cannot here more particularly explain or refer to the subject. But this phantom population, springing out of the ground as it were, and arraying itself before us as we traversed the dreary and heaven-condemned waste, although we were entirely convinced of the cause of the apparition, excited those superstitious emotions so natural to all mankind.

Function of the Skin in Man and Animals

In a very curious experimental paper, Dr. Ducros shows that a coating of gumlac put on the skin of animals, causes them to die in a longer or shorter time by producing convulsive movements similar to epilepsy. When the animals coated with gum-lac were subjected to electricity they died in a much shorter time. He next tried the effect of metallic coverings as he entertained the notion that, because they had opposite electrical properties, animals so coated would die with symptoms of an opposite nature. He therefore cut off the hair from some animals and covered them with thin plates of tin (tin-foil) and found that they perished with symptoms of debility the reverse of what he had noticed when the coating consisted of a resinous substance.—When the tin was covered with a coating of gum-lac the animals perished still more rapibly. He then placed under the influence of electricity some of the animals covered plates of tin and found that so long as they remained connected with the electrical current their vigor appeared to be restored; but that whenever it was arrested they appeared ready to perish. The object of these experiments was to ascertain what would be the likely effect of such coverings in certain diseased states of the human frame and especially in nervous or neuralgic affections and in rheumatism. He reasoned that if metallic coverings deprived animals of life by producing rapid sinking of the vital powers the same metallic plates applied to the human body would cure or remove those diseases which seemed to depend on an excess of organic life. On putting his plan to the test of practice he was so fortunate as to find that it removed some nervous, and a few acute and chronic rheumatic affections. The plan of treatment was of no avail in any case where the disease was dependent on, or connected with organic lesions, or attended with fever, or swelling of the part, or with general weakness; on the contrary, in all these eases the metallic plates augmented the disorder.

Land of Plenty.

In Singapore, with the exception of children and bedridden adults, it would be impossible to suffer from starvation: privations are the lot of all; but it must be said for this tropical region, that an all-kind Providence seems to have opened her stores most lavishly for the use of man; he needs neither to toil or spin, and yet like the lilies of the field, he can be fed and clothed. Every cleared spot that is allowed to run into jungle furnishes leaves of various kind that can be used in curries or in stews. The common *Ubi kayu* gives a delicious arrowroot, and this plant is found as a weed, and used as a fence; in all parts, the clady (*Arum esculentum*) that springs up indigenous to our marshes and ditches though possessed of a poisonous fluid in its leaves and epidermis of the root, yet furnishes in the latter, when boiled, a wholesome food for man and fattening nourishment for pigs in its leaves. The sea and rivers teem with fish and the beaches with molluscs and edible sea-weeds. If any part of a ditch is dug, in three or six months it will be filled with fish, and daily from it you will see superannuated women and young children drawing out small yet tasty fish, to season their dry rice or insipid caldy.

Coral Formations.

A barrier-reef off the north-east coast of the continent of Australia, is the grandest coral formation existing. Rising at once from an unfathomable ocean, it extends one thousand miles along the coast, with a breadth varying from two hundred yards to a mile, and at an average distance of from twenty to thirty miles from the shore, in some places increasing to sixty and even seventy miles.—The great arm of the sea included between it and the land is nowhere less than ten, occasionally sixty fathoms deep, and is safely navigable throughout its whole length, with a few transverse openings by which ships can enter. The reef is nearly twelve hundred miles long, because it stretches nearly across Torres Straits.

The long ocean-swell, being snddenly impeded by the barrier lifts itself in one great continuous ridge of deep blue water, which curling over, falls on the edge of the reef in an unbroken cataract of dazzling white foam Each line of breaker runs often one or two miles in length, with not a perceptible gap in its continuity. There is a simple grand display of power and beauty in this scene, that rises even to sublimity. The unbroken roar of the surf, with its regular pulsation of thunder, as each succeeding swell falls first on the outer edge of the reef, is almost deafening, yet so deep toned, as not to interfere with the slightest nearer and sharper sound.

Dying for another Man's Wife.

Mr. L— resides in Henry street. His wife who is an economical body, has sent a costly silk gown to a French dyer. The dver himself brought the dress home, and unlucky as it happened met the husband of the lady at the door. "Is madame within?" asked the Frenchman. The husband who is of a jealous disposition, replied, "And suppose she is, what do you want with her?" "I am dying for her sair." "You dying for my wife—get out of my house, you scoundrel!" and he had just raised his foot to kick the honest mechanic into the street, when the lady made her appearance and set the matter to rights.

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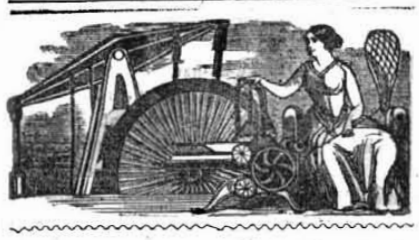


New Inventions.

Improved Skate.

Messrs. Alex. Barclay and C. W. Bontgen, of Newark, N. J. have made a very beautiful improvement in the manufacture of Skates, which renders them far more easy of adjustment to the foot than by the old plan. The improvement consists in providing a skeleton malleable iron sole to which the runner is rivetted or attached by screws, and having two rings cast on the sole at both sides at the instep to supersede the old side buckles. A steel spring is also attached to the sole under the instep making the skate elastic with the play of the muscles of the foot, enabling the wearer to skate with great ease. There is no winter exercise more beautiful and healthful than skating. This is an art for which old Ben West used to be the admiration of all the Londoners.

Improvements in a Felloe Cutting Machine.

Messrs. J. L. Adams and L. H. Moores, of Amherst, Mass., gentlemen long engaged in the manufacture of felloes for carriage and wagon wheels, have lately made some very important improvements in their machinery, which enables them to produce a far greater amount of work and of a superior character than they could do heretofore with the same power.

Machine for Washing Potatoes.

At a late exhibition of the Smithfield Club, England, we see that a prize was awarded for a machine which should attract the attention of our farmers. It was a machine for washing potatoes, turnips, carrots, &c. The roots to be washed were placed in a cylinder made of spars with an Archimidean screw inside, the whole being partly immersed in water. The roots were placed in the cylinder at one end and the cylinder revolved in the water until they were clean, when by turning it in the contrary direction, the washed roots were discharged into a trough at the other end. We hope the hint will not be lost, every labor saving machine to the farmer is a benefit to the whole community.

Gas Light Monitor.

A patent has recently been taken out in England which appears to be a good one for gas consumers. It consists of a circular valve enclosed in a box which is placed before the burner and through which the supply of the gas is furnished to the burner. The burner is a tin plate of brass, perforated in the centre and weighing about fifteen grains; it is quite loose in the chamber which contains it, and the mode of its operation is this:—When the pressure of the gas through the chamber does not exceed a certain fixed amount, the supply to the burner is such as to prevent any waste or smoke, but the moment the pressure exceeds this fixed amount, the valve is raised by it to the top of the chamber, where, by closing all the apertures through which the gas is supplied to the burners the supply is at once cut off,—and what gas is requisite to maintain the light rushes through an aperture pierced in the centre of the valve, the size of which regulates the consumption. The instant the extra pressure diminishes so as to allow the gravity of the valve to exert its force, the valve falls back to its first position at the bottom of the chamber.

Improvement in Propellers.

English papers say that Sir Thomas Mitchell has made successful experiments on a method of propelling through water by the screw,—which avoids the lateral resistance offered to all existing applications of the instrument; and has left behind instructions for a patent—which is now complete. Sir Thomas expects great things from this construction—no less, we understand, than a performance of 500 miles a day for large steamers. This no doubt is *doubtful*.

Another Flying Machine.

The Boston Post says: "Capt. John Taggart, of Charlestown, is building a machine to navigate the air. We have seen a picture of the balloon, and a minature of the sails and the way he creates a new element with them. President Everett and Threadwell, of Harvard College, and Mr. Pook, the naval constructor, we understand have expressed favorable opinions of the project. Capt. T. has invested $1500, and wants to raise as much more by subscription, in order to complete the carriage for the upper deep by the 4th of July."

Mr. Taggart had better take the advice of Paul, "abide by the ship."

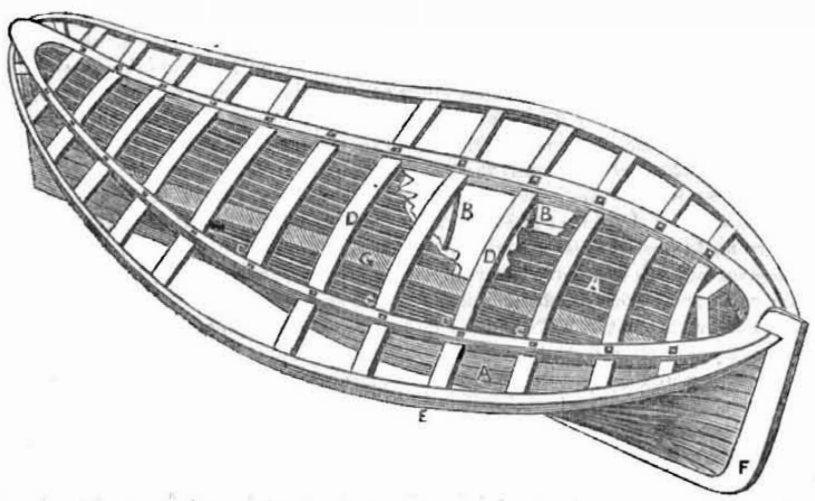
Fac-Similies of Busts.

Mr. Jas. Gall of Edinburg, Scotland, has discovered a method of taking a strictly accurate likeness in form of a bust, by means of a mask of so peculiar a kind, that persons are able to read at ease while the mould is being taken, and which is so light that not a feature is falsified by its weight or pressure. The substance by which he does this is not yet made public, but it is supposed to be Samaritan oil of Gutta Percha dissolved in chloroform. The chloroform evaporates in an instant, leaving a skin of gutta percha, which repeated until thick and resistive enough, would form a mask exceedingly light and delicate.

It is inexplicable to us how the mould can taken and the person reading at the time.

A foreign paper says that a razor has been invented in England which carries with it a guard that makes it impossible to cut the skin when shaving—a statement which appears to be a doubtful *fact*.

IMPROVEMENT IN SHIP BUILDING.



This is a plan of constructing vessels, invented by Mr. G. W. Fellows and brother, of this city, and it is worthy of the attention of our nautical men. Messrs. Fellows are the patentees, and their agent is Mr. W. F. J. Damon, No. 15 South st. The principle is to construct vessels of all kinds, without the use of heavy cumbrous timbers, placing in their stead small round iron or copper ribs, which pass vertically from the keel through the centre of every plank and deck beam where they are secured by large screw nuts which bind the vessel together.

This engraving represents a model hull of a steam boat, but the principle is applicable to all vessels. There is a small part of the side planking removed at B B, to shew how the iron ribs pass vertically through the planking. A is the planking which must be thicker than that in common use for the bore of the ribs, and this can be had as easily as a thinner kind and save inside ceiling. The ribs are made to pass through all the timbers and each rib is secured at the top by a screw nut C, which can be screwed down to match the seams like a piece of cabinet work. D are the deck beams and E the guard rail, F the keel.

The advantages claimed for this method of constructing ships, boats and other vessels, are greater strength, buoyancy, durability, more room according to the tonnage and a general economy. More information about rights, &c. may be obtained of Mr. Damon as above directed.

Cholera Protector.

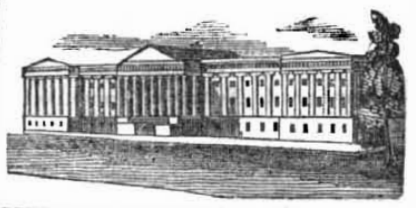
This is a new galvanic belt invented by Mr. Chas. Rodgers of Jefferson, Wisconsin, and the difference between it and the galvanic rings is perceptible at a glance. The invention is the result of practical experience during an extensive practice of 16 years in various parts of the world, and it is based upon sound reason—no guess work about it. Our readers may remember that the presence of cholera in St. Petersburg and other places was accompanied with a diminished quantity of electricity in the atmosphere; this fact has been corroborated by the experience of the inventor. Now it is a well known fact that between our nervous system and electricity, there is a mysterious connection. This belt is to wear round the body to generate and impart to the system the desired quantity of the galvanic fluid.

Fig 1.

This is a perspective view. A is a plate of copper and B a plate of zinc. E, is a covering of india rubber, and it is covered with silk. D, is the conducting chain indicated by dotted lines in the interior. C are pieces of felt.

Fig. 2.

Is a section view. The same letters indicate like parts. The conducting chain D, is here shown without the india rubber and covering. The intention of the belt is to furnish a continued flow of the fluid especially to the ganglions of the sympathetic nerve and to the nerves of motion and sensation at their origin from the spine. This is accomplished by moistening the pieces of felt with a weak acid solution. The conducting chain is far superior to a wire or ring as it will conform to the motion of the body and it is easy to wear and keeps the plates in contact with the skin. No galvanic belt like this has before been presented to the public. It is constructed on the best principles and it is worthy of general attention. Measures have been taken to secure a patent.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending January 2, 1849.

To Ephraim Larrabee, of Baltimore, Md., for improvement in Shower Baths. Patented Jan. 2, 1849.

To J. F. Flanders, of Newburyport, Mass., for Combined Beading Tool and Circular Shears. Patented Jan. 2, 1849.

To R D. Munson, of Williston, Vt., for improvements in attaching and detaching Hubs and Axles. Patented Jan. 2, 1849.

To T. Hopper and T. Garrison, of New Brunswick, N. J., for improvement in Journals and Boxes. Patented Jan. 2, 1849.

To Joseph Ross, of Ipswich, Mass. for improved Swinging Bridge. Patented Jan. 2, 1849.

To Abner Leland, of Milton, Pa., for improvement in Combined Ploughs. Patented Jan. 2, 1849.

To Jesse Layman, of Lebanon, Ohio, for improvement in Ploughs. Patented Jan. 2, 1849.

To A. S. Macomber, of Bennington, Vt. for improvement in Turning. Patented Jan. 2, 1849.

To Edward Clark, of Brooklyn, N. Y., for improvement in the manufacture of Lampblack Colophan. Patented Jan. 2, 1849.

To F. H. Bartholomew, of New York City, assignor to S. Merrick, of Springfield, Mass., for Screw Wrench for grasping cylindrical forms. Patented Jan. 2, 1849.

To James McCarty, of Reading, Pa., for method of Bending Skelps from which iron tubes are made. Patented Jan. 2, 1849.

To Charles Chennock, of New York City, for improvement in connecting Hubs & Axles. Patented Jan. 2, 1849.

To Jonathan Beardsley, of Trenton, N. J. for improvement in Machine for Hook-heading Spikes by one operation. Patented Jan. 2, 1849.

Carpet Looms.

At the new carpet factory in Auburn, N. Y. there are sixteen power looms now set in operation, which are of a peculiar and excellent construction, invented by Mr. A. Babbitt.—Each occupies a space of 5 by 8 feet only and turn out about 20 yards of ingrain and three ply carpet per day. The combination of these looms is said to be of a very superior character and the work they perform is of the best kind. It is indeed a triumph of mechanical genius to make the water wheel and steam engine weave the most variegated patterns. A short time since it required two persons to attend every carpet loom.

New Musical Instrument.

An extraordinary musical instrument has just been erected in the Cyclorama, Albany street, London a new exhibition of moving panoramas, about to be opened. This noble instrument contains 4 distinct organs—3 manual and 1 pedal, it has 9 composition with 3 coupling movements, great drum, side drum cymbals, and triangles. It has 53 stops, 16 pedal movements, and 2407 pipes, and will produce all the effects of several bands. It possesses more power than the Apollonicon of former days, and, in the present advanced taste for music, will doubtless excite a corresponding interest.

Everglades of Florida.

One of the subjects recently discussed in Congress, is that of a proposition that the land embraced under this term, shall be ceded to the State of Florida, on condition that the State shall drain them, and in draining them, make a canal in which vessels may save the passage round the Peninsula of Florida and the dangers connected with it. These everglades are one eight of the land of the whole State. We hope that the Canal will be dug at any rate.

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NEW YORK, JANUARY 13, 1849.

Prize Essay!

ONE HUNDRED DOLLARS PREMIUM!!

The Publishers of the *Scientific American*, desirous of shedding all possible light upon any and every subject pertaining to the Arts and Sciences, with a view to the protection of the rights of Inventors, hereby offer a prize of ONE HUNDRED DOLLARS, payable at their office, 128 Fulton street, on the 1st of April next, for a Review of the present Patent Laws of the United States, with suggestions of alterations and additions for their improvement, and more thorough protection of the results of Inventive Genius from Piracy. Each Essay offered on the subject is not to exceed *thirty pages* of foolscap, to be written in a spirit of independence, regardless of all political chicanery of party or parties, and to comprehend the interests of all classes of Inventors.

Writers interested in improvements of the scientific world who may compete for this prize, must send in their productions before the 4th of March next, at which time the premium will be awarded by a committee of gentlemen selected from various sections of the country. All communications in relation to this Prize Essay sent *post paid* to MUNN & Co. will receive immediate attention.

Winter Evenings for Mechanics.

From our arm chair, we would dictate a few words of advice to our young friends respecting the employment of their winter evenings. We are not among the number of those who think that all kinds of amusement "should be discountenanced" as "trifling enjoyments." There is nothing which tends to elevate men and women more than rational and social amusement. The grand question is, the *rationale* of the matter. Let every one choose to their taste in this respect. We find no fault, if it be not impure and foolish. We would direct attention to the storing of the mind with useful knowledge. There are many young men who are compelled to toil unremittingly during the summer season from sun rise to sun set, and have no opportunity, and never had, of acquiring a suitable education before they were obliged to toil for their livelihood. To such young men, and there are too many of them, and young females too, we would say, let your winter evenings be well spent in acquiring all the education you possibly can. If you are near an Evening School, do not neglect to attend it and pay attention to your studies. If you are not near a school, be sure and have a good book, a writing copy and a slate in the house, and dig out of them all the gold contained therein. Mental study is more severe and less agreeable than physical toil, but set up your stake and march to it with unflinching perseverance. You may be baffled often and feel discouraged, but whenever this is the case lay down your studies for a moment and reflect upon the prize before you. The difference between an American and a savage, is in their education and just in proportion as we are an enlightened people so are we removed from barbarism. As it is with nations so it is with individuals, every man will find his level, except it may be the fortuitous circumstance of being born rich, and even that in our country is not of so much consequence. Young mechanic remember that you have a title to the highest office in the commonwealth.

"Let not thy mind recoil,
At transitory pain or manly toil;
Be thine the task, be thine the care,
Nobly to suffer and sublimely dare,
Wisdom waves on high a radiant prize,
And each hard step but leads thee to the skies.

We hope that the young men belonging to our various Mechanics Institutes are availing themselves of the winter lectures and the good books in the libraries. In the Mechanics Associations throughout this State, (of which there are now a great number, one almost in every village,) and other States, we hope that the older members are by practical lectures scattering the good seed in good soil. You have still a great task before you, but "knowledge is power," and "in union there is strength." We would not dictate to any man what course of study to pursue, we only say lay out the *track*, then on to it like a locomotive. We regret that there are so many vicious and foolish books read by our young men—rank trash they are to mind and body. They tend to make a man like nothing but an old shoe in this world and good for nothing in the next. Our young females, too, are perhaps the most criminal in this respect. We are afraid that the fine matronly character of our old American lady is fast disappearing from among us. We know that it is a hard task to study a work that is obscure and of a logical nature—but a continued effort for some time to master such a work, imbibes a taste for it, and every one knows the difference in point of benefit in being acquainted with the useful sciences, instead of the heroes and heroines of romance. To those who would desire to know the value of winter evenings in acquiring useful information, we say spend them well now, and tell us in ten years after this what has been the result. We predict that California with all her gold would be no equipoise for its value. If at this moment we were offered all the wealth of Mexico as an exchange for the information we possess, so as to leave the mind a savage blank, we would not look at the offer as a measure for the enjoyment we would lose. There is many a sermon contained in the old maxim,

"'Tis education forms the common mind,
Just as the twig is bent the tree's inclined."

With our excellent School Libraries, there is no excuse now for ignorance, let the winter evenings be well employed and there will be none needed.

The Electric Light Again.

By our late foreign exchanges we learn that there is competition in the Electric Light in famous London town. A Chevalier Le Molk and Mr. Staite have both been astonishing the Londoners, the former exhibiting his light from the top of the Duke of York's Column, and the latter on raised steps at the entrance of the Royal Academy. After all it may be asked—what is this Electric Light, how is it made, what are its economical advantages?—Well it turns out after all, like Warner's celebrated long range humbug, that the electric light of Staite is nothing more than the incandescence of charcoal by the currents of a battery—something that has been known since the days of Humphrey Davy. It therefore cannot in our opinion be so economical nor so easily made as coal gas. A brilliant light—a light superior to common gas, is well known in the Drummond Light, but a cheap and easily managed light—a light in which there is no danger of explosions and which can be made cleanly in every household, that is the thing wanted. We believe that electricity in the hands of some genius will yet do this.

The electric light of Mr. Staite is the subject of a patent, the specification of which is now in our possession.

Steam Engines For Sale.

We have now three steam engines for sale of a superior construction and very cheap.—They are 4 horse power each having cylinders of a 6 inch dia. and 1 foot stroke. They can work up to five horse power easily, but we say 4 horse. The castings are excellent, of the very best metal, and the cross heads and shafts are all wrought iron. The bushes and glands are all brass and they have metallic packing. They are of what is called the "horizontal" construction, but work vertical and take up but very little room. If we put them up, they will be warranted for one year, but they are so constructed that almost any person the least skilled in mechanism can fit them up. There are no boilers to them, but a boiler can be furnished for about $160 within two weeks, if ordered. Some person may want an engine who has a boiler, and this is a good opportunity to purchase, as the price is only $250. The workmanship is of the very best order, they being made by a first rate engineer, and are strong and well put together.—Any person wanting one should send in an order to this office as soon as possible.

Patent Laws.

The following is the act of Congress, amending the Patent Laws, passed on the 28th of May last. As many inquiries have been made respecting it, we publish it to answer a number of our correspondents.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there shall be appointed, in the manner provided in the second section of the act entitled "An Act to promote the progress of useful arts, and to repeal all acts and parts of acts heretofore made for that purpose," approved July fourth, eighteen hundred and thirty-six, two principal examiners, and two assistant examiners, in addition to the number of examiners now employed in the Patent Office; and that hereafter each of the principal examiners employed in the Patent Office shall receive an annual salary of twenty-five hundred dollars, and each of the assistant examiners an annual salary of fifteen hundred dollars: Provided, That the power to extend patents, now vested in the board composed of the Secretary of State, Commissioner of Patents, and Solicitor of the Treasury, by the eighteenth section of the act approved July fourth, eighteen hundred and thirty-six, respecting the Patent Office, shall hereafter be vested solely in the Commissioner of Patents; and when an application is made to him for the extension of a patent according to said eighteenth section, and sixty days' notice given thereof, he shall refer the case to the principal examiner having charge of the class of inventions to which said case belongs, who shall make a full report to said Commissioner of the said case, and particularly whether the invention or improvement secured in the patent was new and patentable when patented; and thereupon the said Commissioner shall grant or refuse the extension of said patent, upon the same principle and rules that have governed said board; but no patent shall be extended for a longer term than seven years.

SEC. 2. And be it further enacted, That hereafter the Commissioner of Patents shall require a fee of one dollar for recording any assignment, grant or conveyance, of the whole or any part of the interest in letters patent, or power of attorney, or license to make or use the things patented, when such instrument shall not exceed three hundred words; the sum of two dollars when it shall exceed three hundred and shall not exceed one thousand words; and the sum of three dollars when it shall exceed one thousand words; which fees shall in all cases be paid in advance.

SEC. 3. And be it further enacted, That there shall be appointed in manner aforesaid two clerks, to be employed in copying and recording, and in other services in the Patent Office, who shall be paid a salary of one thousand two hundred dollars per annum.

SEC. 4. And be it further enacted, That the Commissioner of Patents is hereby authorized to send by mail, free of postage, the annual reports of the Patent Office, in the same manner in which he is empowered to send letters and packages relating to the business of the Patent Office.

Approved May 27, 1848.

Potterville.

In Wisconsin there is a settlement of English Potters from Nottingham, England. At the present moment there are 134 individuals in it, who are doing well. This is the result of an emigration society, the shares of which were only about five dollars, paid by instalments, which when this amount was paid, if the shareholder drew a ballot he was entitled to a free passage to America and 20 acres of land in Wisconsin, 5 ready for cultivation with a good log house on it. Half of the estate of Potterville is now peopled and the emigration society in Nottingham have as much funds as will purchase 2000 acres more. This speaks well for a union of effort among the working men to better their condition. These men do not come here to beg—they come with a title to the land they have bought and with means to cultivate it—they make good citizens and when the West goes into the manufacture of pottery ware, she has ready made operatives to commence business with.

Cloth steeped in a solution of the phospate of ammonia, is thereby rendered fire proof.

Southern Factories.

In South Carolina there are two Factory villages which promise to be very successful, viz. Graniteville and Vaucluse. The former is managed by a Mr. Gregg, who is sparing neither pains nor capital to make this labor as attractive as possible and to guaranty a respectable population. The operatives are to have the most commodious dwellings, and "all the comforts, conveniences, and enjoyment of life at their command."

Vaucluse is owned and managed by Gen. Jones, who appears to have introduced among his operatives and in all his operations, the New England system, and the result show the money value of this system. The fabric made is "Choctaw stripes" from nankeen cottons, the filling and half the warp being white cotton; the cost of material is less than 6 cents per pound and the cost of manufacturing the pound of material is less than 3 cents. "His goods are eight ounces to the yard, and it follows that his Choctaw stripes cost 4½ cents a yard and these are sold at 7½ to 8 cents, which shows a handsome margin for commission, profits, &c."

These villages are in a secluded valley, about 20 miles from Augusta, and 125 miles from Charleston.

In Georgia there is a capital of more than $1,000,000 employed in the Cotton Manufacture with an average profit of 20 per cent.

The Ten Hour Bill.

Some thousands of the following petition are now in circulation in this State:—

To the Honorable, the Legislature of the State of New York: We your petitioners, citizens of Niagara County, desiring to protect the rights and interests of the *producing classes* of this State, ask that your Honorable body pass a law making ten hours a legal day's work. We further ask that measures be taken by your Honorable body, to prevent the convict labor of our Penitentiaries coming into competition with the labor and products of the mechanics of said State.

Permanent associations are formed to agitate these questions and bring about these reforms. It will be seen that the petitions are both mild in language and the measures are not ultra by any means.

Interesting Patent Case.

On the 5th inst. before Judge Kane, in the U. S. Circuit Court Philadelphia, injunctions were granted to restrain Eldridge, also Brown and Miller, from using machines for turning irregular forms, as being an infringement of Blanchard's patent. This is the case which we noticed before, on which the Jury could not agree and regarding which we have refused to publish some communications (not from parties interested in these cases) until it was settled. The settlement of the case will lead to the publishing of evidence at some future period on it—according to a promise from Mr. Carter.

A Lathe Machine in operation at Cleveland takes the green log and whittles out of it 120 pieces of lathe per minute. It supplies them at $1 25 per thousand.

Back Volumes of the Scientific American.

A few more copies of complete sets of vol. 3 of the Scientific American may be had at the office, either bound or in sheets. Price neatly bound $2 75, in sheets suitable for mailing $2. The second volume minus 4 numbers from being complete we can furnish for $2 bound, or in sheets and mailed at $1 50. Send in your orders early if you desire them filled for we have but a few more copies left of either volume, and the number is growing less every day.

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Combustion.---Grates, Stoves and Ventilation.

Smoke from a chimney ascends because it is lighter than the atmosphere. When fuel is kindled in a grate it requires a supply of fresh air in order that it may burn freely. It is for this reason that bars are made below as well as in front so that the air may have access to all parts of the fuel, and if the smoke and vapor ascend swiftly it is said to draw well.

Most persons attribute to the chimney some inherent action by which it draws smoke and vapor from the fire, but this is not so, as the chimney is merely an outlet for the products of combustion, and these being heated—lighter than the air seek the readiest means of escape to the atmosphere. The theory of combustion is not very easily explained. The production of heat by friction and the excitement of fire by the chemical affinity of contact generating the inflamable elements, is something which is generally explained with no explanation but this, which is a very vague one, viz that a rapid chemical affinity is induced between the inflamable elements of fuel and the oxygen of the air. The products of the combustion are nearly similar to those of the candle flame, a portion of air is deprived of oxygen, the nitrogen heated as well as the surrounding air; and thus rendered lighter than the great bulk of colder air of the apartment, ascend the chimney; air from the apartment rushes forward to supply the fuel, so that the flame of the fire is constantly drawing upon the air of the apartment for support, which thus yields oxygen, and becomes heated, and formed new heated products, must have free escape, for if it be retarded as in badly-constructed chimneys, then it rolls back with the smoke in sooty volumes and fills the apartment.

Suppose the chimney to be perfectly constructed, it is essential that as much air should in some way enter the apartment, as the fuel consumes, and the endeavour of the air in the external hall or passage to gain entrance and rush towards the fire, is announced by a whistling sound through the keyholes and crevices of the doors and windows; the chief entrance of the air to the apartment is through the space between the door and the carpet; this causes what is comonly called a draught, the danger of which is proverbial; it is a current of air which rapidly deprives the animal frame of heat, and produces the disagreeable and often fatal effect called a cold.

If all crevices be stopped so as a prevent a draught, then the chimney refuses its office, the smoke descends into the apartment and in many houses a window or door must be kept partly or even quite open, to admit the required supply of air, or otherwise the inmates of the apartment could not endure to sit there for the smoke; but this is only remedying one evil by the introduction of another, for it is by no means agreeable to remain in such a thorough draught.

Nothing can be more difficult than to admit a proper supply of air to the fire without causing inconvenience to the inmates of the apartment. In order to warm an apartment comfortably by a common fire, the grate should be placed as near the hearth as possible; it should be wide and shallow, so that the heat may be thrown directly upon the floor; this imparts warmth to the air which sweeps over its surface; this warm air ascends, colder air descends, in its turn becomes warmed, and thus currents are established which soon bring the temperature of the apartment to a proper degree.

In the method of warming apartments by open fires, even when the fire-places are most judiciously constructed, much heated air is lost by passing up the chimney; therefore to economize fuel, more particularly when very large appartments are to be warmed, the coal is burned in close stoves.

The advantages of a stove consist in the very small quantity of fuel which will maintain a very strong fire; the whole mass of the iron stove becomes heated to a considerable degree, and as it is usually placed in the middle of the apartment with its iron chimney or flue partly perpendicular and partly horizontal, the whole surface throws off heat very powerfully, and the air rushing forward to support the fire, impinging upon the heated surface becomes warmed instantly; it ascends, colder air descends, becomes warmed and ascends; and thus currents are more rapidly established, and the apartment more effectually warmed than by the combustion of the same weight of fuel in the ordinary fire-grate.

Very little heat is lost if the flue is tolerably long, and very little smoke passes out at its extremity, because the draught of air through the door of the stove is rapid and powerful, so that all the inflamable matter of the coal is consumed.

It should be remembered that the stove requires a supply of fresh air, as imperatively as an open fire-place, so that a draught is the inevitable consequence of its employment, unless it be supplied with air from a tube entering its lower door and opening into the external air; and if this be done, then there is very little chance of the air in the apartment being renewed; and unless the door of the apartment be opened frequently to admit fresh air, the whole atmosphere will become insufferably heated and unpleasant.

Care should be always taken that the iron-work of a stove never becomes red-hot, or it will gain the power of vitiating the air by combining with the oxygen, ; and though the apartment will be more powerfully heated by the red-hot iron, the air will be rendered unfit for the support of life.

The abstraction of oxygen from air, and the combustion of dust, by the action of red-hot iron, are the principal causes by which apartments warmed by overheated stoves are rendered so proverbially unwholesome.

It is a very excellent plan to place a vessel of water on the top of the stove, that the water may evaporate and supply the air with moisture, and thus correct its oppressive dryness in some degree. Water is always present in the atmosphere in the state of vapor, and is indispensible for the support of life, as will more particularly be shown hereafter.

The ventilation of apartments, and buildings depends upon the escape of the air, which is heated and vitiated by respiration and combustion, and the entrance of fresh air to supply its place.

Nothing conduces more to health than to have plenty of fresh air. It is better to suffer cold than to suffer from a vitiated atmosphere. It is better to wear a great deal of comfortable clothing, than to heat the body at the expence of destroying the lungs. In our cold winters, the seeds of death are strewed broad-cast among those who labor at sedentary occupations by roasting themselves in ill ventilated apartments. Who is he that does not shudder at the late suffocation of 70 poor Irish peasants in a steamboat, where they were pent up with covered hatches in a space where they could receive no supply of fresh air?—Let those who study "the best means to remedy disease" seek for the philosopher's stone in "the best means of preventing it."

Currents of the Ocean.

Many have heard of Lieut. Maury's Current Chart, but there are very few who really know what it is. We will endeavour to explain from his own remarks before the Scientific Association. The object of the Nautical Chart, is simply by the comparison of a great number of log books, to present a chart which will give every master of a vessel the knowledge, at a glance of the direction of the wind and the set of currents which others have experienced in the same place and at the same season.

Charts upon this plan are in course of preparation at the National Observatory, at Washington, for each of the three great Oceans. When they are completed, they will, it may be imagined, form for navigators one of the most complete "Directions" as to the Winds and Currents of the Ocean, that can be found.

For the completion of this undertaking, multitudes of records are required—for it is only by bringing multitudes of such observations together, that we can hope to approach anything like a fair result. For this, several thousands more are still wanting.

As far as the work has progressed, it gives indications of some truly interesting and valuable results. Among these may be mentioned a region of warm water off the Coast of South America, quite as remarkable for its temperature as is the Gulf Stream. "Perry" in August (their Winter month,) found the temperature of the water as high as 76°. The most stormy part of the South Atlantic, between the Equator and the parallel of 40°, is in the vicinity of the Perry's warm region.

These indications of warm water here, and cold water there, are pregnant with meaning. They signify a cold current from the Polar and a warm one from the Equatorial regions. They denote that icebergs are drifting down in a certain direction—that storms and gales are brewing in another—and they remind one with painful emphasis how much that most useful and valuable instrument, the Water-Thermometer, is regarded by Navigators.

Lieut. Maury has been enabled to follow an indication manifested by these Charts up to a point of considerable interest. An examinatisn of several thousand log books led to the discovery of an anomaly in the Trade Winds of the North Atlantic. This anomolous region is situated between the Equator and 10° North, the Coast of Africa, and 25° West. It is somewhat wedge-shaped with its base on the Coast of Africa, and its apex about midway the Atlantic. The log-books of a great many vessels through this region, have been examined and they show that the prevailing winds there, instead of blowing from the Trade quarter blow in the opposite direction. The Trade-winds in this coniform part of the Ocean instead of coming from some point beween N. and E, come, so to speak, from the southward and westward of these points. To the westward of 25°, and between the same parallels, the prevailing winds are from the regular Trade quarter.

Now it is a curious fact, that vessels bound from Europe or America to Southern latitudes, should, from time immemorial, have been in the habit of passing right through this region, with the view of getting winds favorable to the course to the southward and westward. This is the course alike for all whether they are bound for South America or the Indies by either Cape. 2,200 records of the wind in this region, by vessels so bound, have been discussed, and the practical results to be announced to the seafaring men are head winds and calms 1,400 out of 2,200 times. The chances, then, for a fair wind being a greater odds than two or one. The discovery of this fact regarding the winds, led to the pointing out of a new route from the United States to the Equator. With the assistance of these Charts, Lieut. M. has been enabled not only to lay off a more direct route but also to locate it in regions of better winds for that much of the way to the Indies of the South Sea.

Seven of the Rio bound vessels that have been induced to try this new route, have returned their logs—and the average passage of the seven is seen to be eleven days less than the average by the usual route.

Who are the truly Valuable in Society.

The value we set upon a member of society should be, not according to the fineness or intensity of his feelings or the acuteness of his sensibility, or to his readiness to weep for, or deplore the misery he may meet with in the world; but in proportion to the sacrifices he is ready to make, and to the knowledge and talents which he is able and willing to contribute towards removing this misery. To benefit mankind is as much more difficult task than some seem to imagine; it is not quite so easy as to make a display of animal sensibility: the first requires long study and painful abstinence from the various alluring pleasure by which we are surrounded; the second in most cases demands only a little action, and even when sincere, is utterly useless to the public.

A blessed Land.

It is a singular fact that when the cholera, on its first visit, some seventeen or eighteen years ago, ran over Europe, it went entirely around Saxony, without a person being affected, and now, on its second appearance, it is said to be doing the same.

The Boston Journal is informed by Professor Noddlekranz, that California comes from two old Indian words—*Kali*, gold, and *forn a who*, don't you wish you may get it?

The First Locomotive.

The Carlisle Journal gives the following particulars of Mr. Stevenson's first celebrated engine the Rocket. It was brought in 1827 from the Liverpool and Manchester Railway Company by Mr. J Thomas, of Kirkhouse. Here the engine was worked for five or six years on the Midgeholme line—a local line belonging to a Mr. Thompson. Soon after the engine was placed on the line the contest for East Cumberland took place, when Sir J. Graham was superseded by Major Aglionby; and it was used for conveying the Alston express with the state of the poll from Midgeholme to Kirkhouse. Upon that occasion the Rocket accomplished its share of the work, a distance of upwards of four miles in four minutes and a half—thus reaching a speed nearly equal to sixty miles an hour On the introduction of more powerful engines, the Rocket was "laid up in ordinary," in the yard at Kirkhouse;—where it now stands, no less a monument of the genius of the inventor than as a mark of the esteem in which his memory is held by Mr. Thompson. Such an engine, says the Journal—the first constructed on the principle which has brought railways to such a height of perfection in this country—ought to have its abiding place in the British Museum.

We should like to see Oliver Evans's now. It would be a monument to that ingenious American inventor.

Cloth Made of Pineapple Leaves.

At Singapore in the East Indies, there is quite a thrifty branch of business in preparing the fibres of Pineapple leaves for exportation to China, where they are manufactured into cloth. The process of extracting and bleaching the fibres is exceedingly simple.—The first step is to remove the fleshy or succulent side of the leaf. A Chinese, astride on a narrow stool extends on it in front of him a pine-apple leaf one end of which kept firm being placed beneath a small bundle of cloth on which he sits. He then with a kind of two-handled plane of bamboo removes the ~~succulent matter~~. Another man receives the leaves as they are planed, and with his thumb-nail loosens and gathers the fibres about the middle of the leaf, which enables him by one effort to detach the whole of them from the outer skin. The fibres are next steeped in water for same time after which they are washed in order to free them from the matter that still adheres and binds them together. They are now laid out to dry and bleach on rude frames of split bamboo. The process of steeping, washing, and exposing to the sun is repeated for some days until the fibres are considered to be properly bleached. Without further preparation they are sent into town for exportation to China. Nearly all the Island near Singapore is more or less planted with pine-apples, which, at a rough estimate, cover an extent of two thousand acres.

Eccentricities of Rivers.

Instances have occured of rivers suddenly stopping in their course for some hours, and leaving their channels dry. On the 26th of November, 1838, the water, failed so completely in the Clyde, Nith, and Teviot, that the mills were stopped eight hours, in the lower part of the streams. The cause was the coincidence of a gale of wind and a strong frost which congealed the water near their sources. Exactly the contrary happens in the Siberian rivers which flow from south to north over so many hundreds of miles; the upper parts are thawed, while the lower are still frozen and the water not finding an outlet, inundates the country.

The tides of the ocean often flow up rivers to a great distance from their months, and frequently to a height far above the level of the sea. In the Amazons the tide is perceptible 576 miles from its mouth, and in the Orinoco it ascends 255 miles.

National Arbitration.

Richard Cobden the English Reformer, announces his intention to propose in Parliament, and advocate with all his energy, the settlement of international disputes hereafter by arbitration instead of war. This is the right way and it shews that "Richards' himself again."

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TO CORRESPONDENTS.

"G. R. N. of Pa."—Your model and funds have been received and your case will receive immediate attention.

"E. S. B. of S. C."—The engraving of your mathematical delineator shall appear next week.

"D. B. of Me."—You are not the only person who has given us the credit of making thousands of dollars for them by publishing engravings of their inventions. We are as well aware of its being of great importance to them to have engravings published as you are although we are much obliged to you for your kind suggestion.

"S. & Co. of Mobile."—Your check for $140 was received on the 7th. We will ship your machine as early as Monday the 15th, and send you a bill of lading.

"J. D. W. of Ct." "W. F. of N. J." "C. B. of N. H." and "F. D. B. and H. C. F. of N. Y."—Your specifications were received, properly signed, and have been forwarded to the Commissioner of Patents.

"C. and G. of O."—Your patent papers have been received. We cannot inform you how early your invention will be examined—all right now.

"D. C. of Pa."—See the notice of the saw mill in this week's paper.

"A. G. P. of N. Y."—Your fish hook is different from any which we have seen. We should certainly think the invention worth a Patent in this country but would not advise you to apply for a foreign patent.

"N. S. of Me."—The engine of which you enquire was fully described in No. 9 Vol. 4 of the "Scientific American." The "planing" machine we will sell you for $200 cash which is much less than it is worth but which we dislike to pay storage upon longer. Blanchard's machines may he had in Boston or at Newark N. J. by addressing the agents, price not known.

"R J. of N. Y."—The way to estimate the power of water, is to take the weight of the quantity of water that falls per minute multiplied by the height of the fall, and compare that with 33,000 pounds raised one foot high for one horse power. The power of the overshot is as 2 to 3, and there is 62½ pounds in every cubic foot; you can therefore easily calculate the power.

"H. M. of Ky."—The drawings of your apparatus for Beating Eggs, have been received and carefully examined. Your invention is a good one for that purpose, but the combination of its parts are of so common a device that we have our doubts as to your being able to secure the invention by letters patent. It is evident that you possess mechanical ingenuity and we advise you to foster that talent and make an effort on something else.

"S. G. of N. H."—The only type setting machine with which we are acquainted was represented with an engraving in No. 14 vol 2 of the Scientific American, and the explanation of the machine there given was set up by said machine in our presence and appeared to operate very finely. That machine was an English invention but patented in this country. For further particulars refer to that copy of the paper.

"J. W. M of N. Y."—Your former letter was duly received and the names of the subscribers were properly entered on our books.—There is no reason why the papers have not reached them—surely the fault is not ours.

"T. J. F. of N. Y."—The notice you speak of was forwarded in your paper by mistake. We do not fully understand your proposition; please write us more explicitly upon the matter and it will be attended to. $3 received, all right.

"W. W. of Pa.—Your suggestion we decline—your references do not know you.

"H. B. of Pa."—If you intend to alter the arrangement of your machine, it will be necessary for you to make an application to the Patent Office, for an improvement and deposit $15 as fee. If you conclude to do that you had better forward your business to this office and have it done correctly.

"R. C. N. of N. Y.—18 inch circular saws are worth $7,50; 12 inch $4. If you wish them please enclose the amount in a letter forwarded to this office and they shall be shipped according to your order.

"C. and K. of Mich."—We have answered you by mail, also "H. B. of N. Y."

"R. B. of N Y."—We will publish your article next week.

"L. M. P. of Mass."—It is best to have the valve openings as elongated as possible, and not broad.

The gentleman who called at this office last week for a copy of Scott's Engineer's Assistant, may consider this as a hint that we have just received a few copies, and if he will remit us the funds, they shall be forwarded as per order. Price $26,00.

Refused Package.

The person who has sent us a large parcel or box by mail pre-paying only 50 cents postage upon it, is informed that it has been refused by us at the Post Office on account of the large amount of postage ($3,70) yet due on it. If the person who forwarded it will remit to us the above amount we will take it from the office, but if not, it will be sent to the Dead Letter Office at Washington on the 1st of February, from whence it cannot be recalled without extra expense.

The New Mode of Ship Building.

Represented with an engraving on another page of this paper, is an invention of G. W. Fellews, Esq. of this city, long known as the gentlemanly clerk on board the Steamer "Belle," which plies between this city and Albany.

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Any business connected with the Patent office may be done by letter through the Scientific American office with the same facility and certainty as though the inventor applied in person. During the past 3 years we have been constantly applying for Patents and what is a remarkable fact but 2 cases have been refused at the Patent Office and t hse 2 were afterwards granted by reapplication. Our pr ces too (another important consideration to inventors) are but about half as much as the charges of most agents as the amount of business which we do, and that in connection with the publication of the Scientific American renders to us superior advantage over all other agents.

Having been often complimented by those who have entrusted their business in our care, we here repeat what very many have said. "The best Patent Agency in the United States is at the Scientific American office."

All models, drawings or communications that are sent to the Scientific American office for inspection are deposited from the eyes of the public until the necessary application for securing the invention has been made.

The best of artists are constantly employed to make drawings from models and our corps of specification writers are composed of gentlemen formerly connected with the Patent office at Washington as Examiners.

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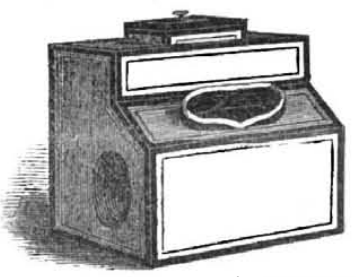
All letters on business must be post paid, and enclose a suitable fee where a written opinion is required. Office on F st. opposite the Patent Office.

He has the honor of refering, by permission, to —Hon. H. L. Ellsworth, late Commissioner of Patents. And to the following testimonial from the Hon. Commissioner of Patents:

Washington November 28, 1848.

To all whom it may concern:—During the time I have filled the office of Commissioner of Patents, and for some time previous, Zenas C. Robbins Esq. has been in the daily prosecution of business in the line of his profession at the Patent Office.

I am well acquainted with Mr. Robbins personally, and believe him to be a man of integrity and ability, to whom persons at a distance may entrust their business. I am pleased to have the opportunity to say that he is faithful to the interests of his clients, and has been, thus far, very successful in the practice of his profession. EDMUND BURKE.



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THE engine and boiler represented in No. 9 of present vol. of the Scientific American is again for sale. Several opportunities for disposing of it have been offered and refused in consequence of its having been sold to a gentleman from the coutry but now he expresses his ability to meet the terms which we require (cash in advance) and the engine is therefore offered for sale again. Any person now desiring it can have it shipped to his address for $150 cash which is $25 less than it is actually worth. Address MUNN & CO.
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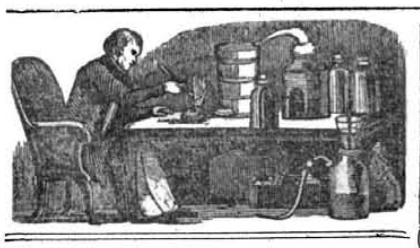


Making Colors.

(Concluded from our last.)

PRECIPITATE OF CUBA WOOD.—(*Morus tinctoria.*)—Dissolve in water about 100 parts in chips, strain this solution through a silk cloth, and then pour into it, a little at once, several times, stirring the mixture, 10 parts of the deutochloride of tin diluted in 20 parts of water and 4 parts of sulphuric acid at 66°. When the precipitate has been deposited, drain off the supernatant liquor and wash it a number of times with fresh water, till all the acid taste is gone The precipitate is then to be filtered and kept in a humid state till required for use.

PRECIPITATE OF FUSTIC.—(*Rhus Continus.*)—Dissolve in water 100 parts of chips; strain the solution through a cloth, and then pour into it, a little at a time, stirring well, a solution of 10 parts of the chloride of tin in 20 parts of hot water. When the precipitate has been deposited draw off the supernatant liquor, and filter without washing, and then lay past in a damp place.

PRECIPITATE OF WOAD.—Make a solution of 100 parts of woad, and add during the operation one part of the supercarbonate of soda. Then strain the solution through silk and add gradually, stirring well, a solution of 2 parts of alum dissolved in 8 parts of water. Remove then, from the precipitate, the supernatant liquor and filter without washing. Keep damp.

PRECIPITATE OF ORCHIL.—Make a solution of about 220 lbs. of orchil prepared for dyeing, and strain through silk, then add gradually, stirring well, a solution of 49 lbs. 8 oz. of alum free from iron, in 104 quarts of warm water, agitate this for about 6 minutes and add a solution of 68½ parts of supercarbonate of soda in 16 parts of warm water.—When the precipitate is deposited draw off the supernatant liquor, filter the precipitate and keep damp.

PRECIPITATE OF COCHINEAL.—Boil twenty five parts of cochineal, strain it and add gradually, stirring, 6 1-4 parts of the protochloride of tin or muriate of tin, (*chlorure staneux*) and the like quantity or the chloride of tin in 29 parts of warm water. Draw off the supernatant liquid, filter without washing and keep damp.

By means of one or other of these precipitates, and with the aid of the soluble blue or indigo vat (*carmin d' indigo*) to be met with in commerce, all the shades of golden yellow, of jonquil yellow, of violet, of Parma violet, of green and couleurs de mode may be obtained. For example, a golden yellow may be produced by taking about 4 lbs. 6 oz. of a solution of gum Senegal and about 2 lbs. 3 oz. of fustic precipitate, mixing the two ingredients well and adding about one ounce and a half of oxalic acid dissolved in a little water. Green may be produced by taking 5 lbs. 7½ oz. of the precipitate of the fustic, and dissolving therein by heat 1 lb. 9 oz. of gum Senegal and 1 lb 1½ oz. of soluble blue or indigo vat (carmin d' indigo) well levigated with an aqueous solution of gum. A green of another shade may be produced by adding 5 lbs. 7½ oz. of the woad precipitate and dissolving in it 2 lbs. 3 oz. of gum Senegal, adding to it about 4½ oz. of alum, 1 oz. of oxalic acid and 1 oz. of the chloride of tin, and mixing these matters well together and adding soluble blue or indigo vat, till the desired shade is obtained. A scarlet may be produced by taking 2 lbs. 3 oz. of the precipitate of cochineal, mixing it well with the same quantity of warm solution of gum Senegal and then adding about 2½ oz. of oxalic acid, and the like quantity of the oxalic of potash. A Parma violet may be produced by taking one part of an aqueous solution of gum and mixing it up thoroughly with the same quantity of orchil. As all the coloring principles which form the basis of these colors are insoluble, fabrics printed with them should be kept damp when exposed to the influence of steam.

Fabrics printed by rollers should be exposed to the steam for about 30 minutes without having been previously dried; but after having been wound as usual on folds of dry calico. Fabrics printed by hand with one or more colors (*a la perrotine*) should be first regularly and properly dried, and then dampened again by rolling them on wet calico. After this operation, the length of which will vary according to the nature of the fabric and the kind of printing, the goods should be exposed to the steam for about forty minutes.

From what has been thus stated it will be seen that the great distinction between the ordinary modes of preparing and applying the colors aforesaid and those herein specified, consists in this, that by the ordinary method the colors are soluble and always accompanied with brown matters which impair their purity; and besides as they strongly attract the damp, but unequally, they cannot be steamed or vaporized completely without running, while by the improved method now specified, the colors being purified and made insoluble by their previous preparation, the result is, that they can be fixed uniformly by steaming, and that on account of this same insolubility, the steaming can be effected in the presence of a great deal of water, which allows of the operation being abridged, while a perfect combination of the colors with the fabric is thus effected.

The improvements claimed in this invention are as follows:

1. The modes of preparing the colors aforesaid, before described, from insoluble precipitates, instead of soluble extracts, which, precipitates, notwithstanding their insolubility, combine perfectly with the fabrics.

2. The application of the colors thus obtained to the printing of stuffs composed of silk or wool, or a mixture of silk and wool by the process of steaming (vaporisage,) before the printed fabrics have been dried, or when they have been wetted afresh, after having been dried previously.

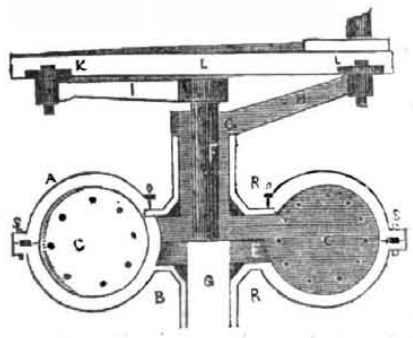
A patent for the above was granted to Mr. Robertson, of Fleet street, London, Dec. 10, 1847, and enrolled June 10, 1848. It was communicated from abroad, and is no doubt a French invention.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

MEAD'S STEAM WHEEL.

FIG. 32.

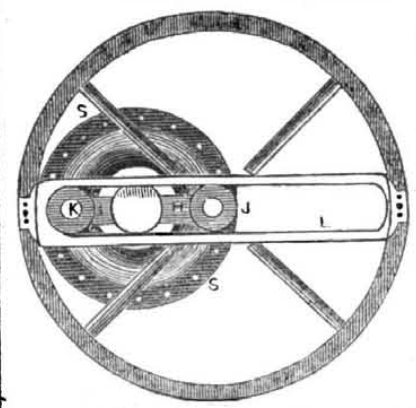


This is a rotary engine invented by a Mr. Mead of Hull England, and patented in 1805. A and B, fig. 32, are two circular plates similarly constructed having their insides turned true. A has its inside uppermost, B its outside uppermost. Each of these plates have a flange and semi-circular cavity formed for the reception of the pistons which are afterwards described, and a recess or hollow part formed round its centre for a small circular plate to turn in. Near to the edge of each recess is a small groove running quite round it and O O, is a metallic ring in the bottom of each groove capable of being adjusted by screws on the outside of each plate. At its centre is a boss for the reception of spindles F and G. *a a*, Fig. 34, are two holes in the plate A to which pipes are fitted, the one to convey the steam into the plates and the other to conduct it from them into the condenser, (the escape.) C C, are two pistons with grooves round them to admit of a packing. D and E, are two circular plates to which the pistons are made fast. F and G, are two shafts or spindles, G is made hollow to receive F, which passes through it. H and I, are two arms made fast to the spindles, each arm near its extremity carries a friction wheel K and I. L is a fly wheel fixed to one end of a shaft having in its side opposite to its axis a groove running across its diameter for the reception of the

FIG. 33.

friction I wheels and K, which wheels when the pistons are in motion, work in it and give motion to the fly wheel and other machinery connected with it. R R, are hollow plates for the bosses to work in. S S, are flanges by which A and B are fastened together. Fig. 33, is a front view of one of the pistons with its circular plate, arm and friction wheel J, the arm H, D a circular plate, and C the piston. V V V, are grooves for the reception of the packing. When the engine is to be put together, the arms are taken off from the spindles. F is then to be inserted in G which with their respective pistons are placed in one of the plates and the one plate, or it may be called "a shell," is placed over the other and fastened with screws or otherwise, so as just to admit the pistons with their respective plates and spindles to turn round in their channel nearly steam tight. The arms may then be made fast on the spindles and the engines erected. Place the direction of its axis in a horizontal direction parallel with the direc-

FIG. 34.



tion of the axis of the fly but nearly as much out of that line as the length of one of the arms H and I taken from the centre of the spindle to the centre of its friction wheel and set such a distance from the fly as to admit of the friction wheels moving freely in the groove in its face. By doing this, the axes of the engine will be placed eccentric with the axes of the fly.

If the fly is then turned half way round upon its axis, one of the friction wheels will remain locked or held fast in the groove near its centre, and the piston with which it is connected remain nearly stationary in the steam chamber, between the holes *a a*, while the other friction wheel, with its arm, spindle, small circular plate and piston, make nearly one complete revolution, round their common centre of motion, or the centre of the engine. If the motion of the fly continue till it has made one complete revolution round its own axis, the friction wheel which was locked or held fast in the groove near its centre, will move off in the groove towards the circumference of the fly with arm, spindle, small circular plate, and piston, make nearly one complete revolution round their common centre of motion, or the centre of the engine, and the other friction wheel in its turn remains locked, or held fast in the groove near the centre of the fly, and the piston with which it is connected remain nearly stationary within the steam chamber between holes *a a*; and so on, alternately, as long as the fly continues in motion.

Tinning Copper.

Copper is tinned by scraping its surface, heating the plate, sprinkling a little resin and sal ammoniac upon it, pouring some melted tin, or a mixture of tin and lead upon the copper and spreading it evenly over the surface by means of a many folded cloth.

Copper is tinned for the purpose of defending it from the action of the acids and fats used for cooking.

The doubts which have been raised for years past respecting the wholesomeness of tinned copper, and those to which the accidents occasioned by glazed pottery have given birth, caused an alarm to society to be created by morbid sensibility, and many fancied remedies have been proposed for the imaginary evil.

Maloinn, in 1843, proposed to employ spelter or zinc for this purpose; but he and his followers forgot that although zinc is harder than tin, yet it is still more easily attacked and dissolved by acids.

Of late the French have begun to tin their copper vessels, with tin hardened by iron. For this purpose they melt together eight pounds of tin, and one of iron turnings, or small nails in a crucible; adding a handful of salt, or of pounded glass, to keep the air from the metals while they are melting.

Rinman for the same purpose has proposed several cheap enamels, for lining copper and iron vessels, mostly composed of fluor spar, gypsum, and common glass in various proportions.

Sulphate of Lead a Substitute for White Lead.

To 100 parts of litharge add 30 parts of salt, and let it stand five or six days at a temperature of 60 to 68° Fah., then add 80 or 90 parts of concentrated sulphuric acid and 30 parts of water and keep it at a temperature of 190° for three hours, then distil the muriatic acid of the salt by heat, when the sulphate of lead remains which should be well washed and dried for use.

If a little of the muriate of lime is mixed with weaver's paste, it enables the web to be woven in a drier chamber than is usually employed for this purpose. The reason of this is, the lime absorbs the moisture from the atmosphere. This is a good idea for fine hand loom goods.

Gold is the only metal which has a yellow color. In ductility and malleability it exceeds all other metals; but is surpassed by several in tenacity. Its density is 19.275. It appears to have been known by the earliest races of men, and to have been esteemed by them as much as by the moderns.

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